



10/536499



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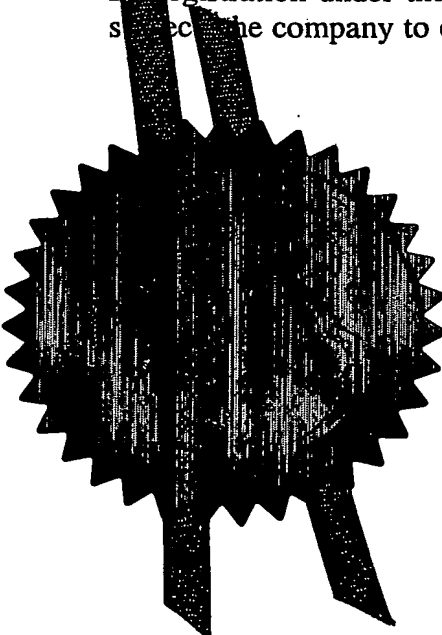
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

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Signed *Andrew Jones*

Dated 27 October 2003

Patents Form 1/77

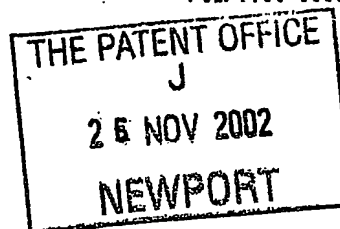
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26NOV02 E766121-1 000637
P01/7700 0.00-0227455.3

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)



The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference 3692

2. Patent application number
(The Patent Office will fill in this part) 0227455.3

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

Arjo Wiggins Limited
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United Kingdom

7455553002

4. Title of the invention Verification System For Magnetically-Written Data and Images

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Patents ADP number (if you know it)

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4332219003 ✓

Abel + Imray
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147001
0745553002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country	Priority application number (if you know it)	Date of filing (day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:
 - a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.

See note (d))

Yes

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

5

Claim(s)

Abstract

Drawing(s)

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents
(*please specify*)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date

R. I. Norris

25 November 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

R.J. NORRIS Authorised Agent (01494) 652241

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Notes

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International (PCT) Patent Application No. WO 01/92961A discloses a sheet material carrying a coating containing cavities in which electrically- and/or magnetically-activatable particles are located. The thus-coated sheet material is machine-writable and -readable in a similar manner to media such as audio or video tapes, and floppy and hard disks for use in computers. The magnetically-activatable particles disclosed in WO 01/92961A are of the same general kind as used in media as just referred to, and include chromium dioxide, iron oxide, polycrystalline nickel-cobalt alloys, cobalt-chromium or cobalt-samarium alloys, or barium-ferrite. The base sheet on which the particles are coated is typically a natural or synthetic paper.

Our unpublished UK Patent Application No. 0212358.6 filed 29 May 2002, discloses a magnetically-activatable sheet product comprising a pair of laminated outer sheets between which is a magnetic layer comprising magnetically-activatable particles in a binder matrix, the outer sheets having sufficient opacity to mask the appearance of the magnetic layer. The outer sheets are preferably of paper, although plastic sheet materials which simulate the properties of paper (so-called "synthetic paper") can alternatively be used. The magnetic layer may be formed by a coating (hereafter referred to as a "magnetic coating") on the inwardly facing surface of one or both of the outer sheets, or may be formulated as a laminating adhesive which is applied as or just before the two outer sheets are brought together in a laminating press or similar equipment. Preferably, the or each outer sheet carries a pigment/binder primer coat on its inward facing surface so as to enhance the masking effect. Such a primer coat also improves the "hold out" properties of the sheet with respect to a subsequently-applied magnetic coating, thereby facilitating the application of the coating in a uniform and even manner and minimizing waste of the magnetic coating by absorption into the body of the sheet.

Alphanumeric data which has been magnetically written on to sheet products such as described above can be erased, overwritten or altered using magnetic data writing equipment which is fairly readily available. This can provide an opportunity for fraud.

5 Pictorial or graphic magnetic images, though erasable, are less susceptible to fraudulent alteration because the equipment required to produce them is more specialized and less widely-available, and unlike alphanumeric characters, images can be created individually rather than being of a standard form.

10 We have now developed a simple and effective verification system, which utilizes the fraud resistant property of magnetic images. The system requires that a reference image be magnetically written into a document or similar, in addition to normal alphanumeric data. If an attempt is made to tamper with the alphanumeric data, the magnetic fields used to create alterations will also disturb or corrupt the reference image. Therefore
15 verification merely requires a check that the reference image is unaltered. This can be done using a variety of magnetic means, for example by dusting on "magnetic toner", i.e. a toner composition formulated to include magnetic particles or pigments (or, in principle, any other particulate magnetic material) or by means of a "magnetic loop", i.e. a "sandwich" of fine iron oxide particles in a liquid medium between two sealed transparent
20 sheets, for example of glass or clear plastics material.

In either case, the magnetic particles take up a distribution corresponding to the magnetic field of a reference image with which they are brought into proximity. The configuration of the magnetic reference image remaining on the document is thereby revealed, and can
25 be compared with the standard reference image. Conformity indicates the absence of tampering (and also of disturbance based on extraneous magnetic fields to which the document might have been exposed without fraudulent intent). By contrast, a significant disconformity suggests tampering or an attempt at tampering, or else exposure to extraneous fields which have corrupted the data.

Accordingly, the present invention provides a method of verifying the accuracy or authenticity of magnetic data or images on a document, wherein:

- 5 (a) the configuration of a magnetic reference image in the document is made visible by bringing movable particulate magnetic material into proximity therewith such that the particulate magnetic material takes up a distribution corresponding to the magnetic field of the reference image; and
- 10 (b) the magnetic image configuration thus revealed is compared with the reference image to identify any significant disconformity suggesting past exposure of the document to a magnetic field capable of altering said magnetic data or images.

The invention also extends to a document intended for verification by the method
15 according to the invention and carrying a magnetic reference image in addition to said magnetic data or images.

It will be appreciated that the magnetic reference image is not initially visible to the naked eye, and therefore that the security afforded by the present invention is covert in nature,
20 i.e. it will not be readily apparent that a security feature is present.

In its simplest form, the invention can be practised as a manual verification method in which magnetic toner or other particulate magnetic material is dusted on to or otherwise applied to a document to be verified. The magnetic material particles stick to the
25 magnetised areas of the document. A visual check can then be made to establish whether the reference image is both present and uncorrupted. As an alternative to the use of dusted on particulate magnetic material or similar, a magnetic loop can be used, as previously described.

30 As an alternative to manual verification as just described, the document to be verified can be passed through a modified non-impact printer of the magnetographic or laser printer type, and which uses magnetic toner. The magnetic toner particles stick to the document only in its magnetised areas so developing the image. The developed toner image can be left un-fused, so that the image used for verification can be wiped away and become

invisible again, or fused, to provide a permanent image to facilitate comparison with the standard reference image. This comparison and the associated verification step could themselves be automated, rather than manual.

5

The invention will now be illustrated by the following Example, in which all parts and percentages are by weight unless otherwise stated.

10 A 49 g m^{-2} strong lightweight base paper of the kind conventionally used in pressure-sensitive copying paper was blade coated on a large-scale pilot plant coater with a 46% solids content aqueous primer coat formulation of the following composition:

	<u>Component</u>	<u>Parts by weight (dry basis)</u>
	Calcined clay	100
15	Oxidised potato starch	5
	Styrene-butadiene latex	15

The coatweight applied was about 9 g m^{-2} on a dry basis, and the result was an opaque paper with a flat primer-coated surface.

20

The primer coated surface was then coated with a 41% solids content aqueous magnetic coating formulation using a small scale pilot plant blade coater. The coatweight applied was about 10 g m^{-2} on a dry basis, and the coating formulation was as follows:

25	<u>Component</u>	<u>Parts by weight (dry basis)</u>
	Iron oxide	100
	Styrene-butadiene latex	17.6

30 A small-scale pilot coater/laminating press was used to laminate one ply of primer-and magnetic-coated paper as just described to a primer-coated sheet as described above but which did not carry a magnetic coating. The magnetic-coated surface faced inward, so that it formed a magnetic layer between the two paper plies. A 15% solids content aqueous solution of polyvinyl alcohol was used as a laminating adhesive and was continuously rod coated on to the magnetic coating just before the laminating nip.

A portion of the resulting product was then magnetically imaged (encoded) with a known bar code at 37.5 bpi (bits per inch) using an inductive magnetic writer of the kind conventionally used for encoding the magnetic strips of credit cards.

5

The bar code served as a reference image and covert security feature, and could be made visible using a magnetic loop.

10

The thus encoded sheet was then passed through the writer a second time, but with the writer arranged to write a different bar code. The magnetic loop was again used to make the resulting image on the sheet visible. The thus-visualised image was compared with the original reference image and found to be different, indicating that the sheet had been altered by exposure to a further magnetic field after the original image had been applied.

PCT Application
GB0304407

